What is claimed is:

1   1. A method for use in packet communication, comprising the steps of:

2   encapsulating contents of a first Ethernet packet received at a port of a switch of a

3 metropolitan area Ethernet network in at least one encapsulating Ethernet packet that is to

4 traverse said metropolitan area Ethernet network; and

5   assigning the source address of said at least one encapsulating Ethernet packet to

6 be the address of said port at which said packet was received.

1   2. The invention as defined in claim 1 wherein said contents of said first Ethernet

2 packet is the entirety of said first Ethernet packet.

1   3. The invention as defined in claim 1 wherein said contents of said first Ethernet

2 packet is a portion of said first Ethernet packet.

1   4. The invention as defined in claim 1 wherein said encapsulating and assigning

2 steps are performed in an Ethernet switch of said metropolitan area Ethernet network at

3 an interface between said metropolitan area Ethernet network and another Ethernet

4 network.

1   5. The invention as defined in claim 1 wherein said encapsulating and assigning

2 steps are performed in an Ethernet switch of said metropolitan area Ethernet network at

3 an interface between said metropolitan area Ethernet network, which serves a plurality of

4 entities, and another Ethernet network, which serves only a single one of said entities.

1   6. The invention as defined in claim 1 further including the step of incorporating

2 in said at least one encapsulating Ethernet packet an entity identifier which is a function

3 of said address of said port at which said packet was received.

1   7. The invention as defined in claim 6 wherein said entity identifier is a virtual

2 local area network (VLAN) tag.

1   8.   The invention as defined in claim 1 wherein said encapsulating step is
2   performed so that a first portion of said first Ethernet packet is encapsulated in said at
3   least one encapsulating Ethernet packet and a second portion of said first Ethernet packet
4   is encapsulated in at least a second encapsulating Ethernet packet that is to traverse said
5   metropolitan area Ethernet network, the method further including the step of:
6   assigning the source address of said second encapsulating Ethernet packet to be
7   the address of said port at which said packet was received.

1   9. The invention as defined in claim 1 further including the step of:
2   assigning said at least one encapsulating packet a destination address as a function
3   of a stored association between the destination address of said first Ethernet packet and a
4   destination address for said metropolitan area Ethernet network of a previously received
5   Ethernet packet from said metropolitan area Ethernet network.

1   10. The invention as defined in claim 1 further including the step of:
2   assigning said at least one encapsulating packet a destination address as a function
3   of a stored association between the destination address of said first Ethernet packet and a
4   port of said metropolitan area Ethernet network.

1   11.   The invention as defined in claim 1 further including the step of:
2   assigning said at least one encapsulating packet as at least one type from a set of
3   types consisting of a broadcast packet and a multicast packet.

1   12.   The invention as defined in claim 11 wherein said step of assigning said at
2   least one encapsulating packet as a broadcast packet is performed when said first packet
3   is a broadcast or a multicast packet.

1   13.   The invention as defined in claim 11 wherein said step of assigning said at
2   least one encapsulating packet as a broadcast packet is performed when there is no stored
3   association between the destination address of said first Ethernet packet and a destination
4   address for said metropolitan area Ethernet network of a previously received packet from
5   said metropolitan area Ethernet network.

1   14. The invention as defined in claim 1 wherein said metropolitan area Ethernet

2   network supports virtual local area network (VLAN) tags, and wherein said first Ethernet

3   packet is a broadcast or multicast packet, the method further comprising the step of:

4   incorporating an entity identifier which is a function of said address of said port at

5   which said first Ethernet packet was received as a VLAN tag in said encapsulating

6   packet; and

7   assigning said at least one encapsulating packet as a broadcast packet.

1   15. An edge switch for use in a metropolitan area Ethernet network having ports

2   adapted to be coupled to at least one local area Ethernet network, said edge switch

3   comprising:

4   at least one port for receiving inner Ethernet packets from at least one of said local

5   area Ethernet networks and for transmitting inner Ethernet packets to said at least one of

6   said local area Ethernet networks, said at least one port being one of said ports of said

7   metropolitan area Ethernet network; and

8   a memory for establishing a correspondence association between addresses within

9   said at least one local area Ethernet network and addresses of said ports in said

10   metropolitan area Ethernet network.

1   16. The invention as defined in claim 15 wherein given an address of a particular

2   one of said addresses within said at least one local area Ethernet network said switch is

3   operable to retrieve said corresponding associated one of said addresses of said ports in

4   said metropolitan area Ethernet network.

1   17. The invention as defined in claim 15 wherein said memory further associates

2   a time stamp with each said associated address within said at least one local area Ethernet

3   network and address of said ports in said metropolitan area Ethernet network.

1   18. The invention as defined in claim 15 further comprising a virtual local area

2   network (VLAN) tag marker.

1   19.   The invention as defined in claim 15 further comprising a memory

2 associating said at least one port of said metropolitan area Ethernet with an entity.

1   20. The invention as defined in claim 15 further comprising a packet stripper that

2 extracts said inner Ethernet packets from encapsulating packets for transmission to said

3 local area Ethernet via said port.

1   21. The invention as defined in claim 15 further comprising:

2   a packet stripper that extracts at least a respective portion of a one of said inner

3 packets from at least two different encapsulating packets; and

4   an inner packet reassembler that receives said portions of said inner packet from

5 said packet stripper and reconstructs therefrom said one of said inner packets.

1   22. The invention as defined in claim 15 further comprising:

2   a memory writer for forming an association in said memory between a received

3 encapsulating packet's source address and a source address of an inner packet within said

4 encapsulating packet.

1   23. The invention as defined in claim 15 further comprising:

2   an encapsulator that embeds each of said received inner packets as a payload in at

3 least one encapsulating packet and places the address of said at least one port within the

4 source address field of said at least one encapsulating packet.

1   24. The invention as defined in claim 23 wherein said encapsulator further places

2 within the destination address field of said at least one encapsulating packet an address of

3 said metropolitan area Ethernet network that is associated within said memory with a

4 destination address of said inner packet.

1   25. The invention as defined in claim 23 wherein said encapsulator further places

2   within the destination address field of said at least one encapsulating packet an indication

3   that said encapsulating packet is a multicast packet when there is no address of said

4   metropolitan area Ethernet network associated within said memory with a destination

5   address of said inner packet.

1   26. The invention as defined in claim 23 wherein said encapsulator further places

2   within the destination address field of said at least one encapsulating packet an indication

3   that said encapsulating packet is a broadcast packet when there is no address of said

4   metropolitan area Ethernet network associated within said memory with a destination

5   address of said inner packet.

1   27. The invention as defined in claim 23 further comprising:

2   a virtual local area network (VLAN) tag marker; and

3   wherein said encapsulator further places within the destination address field of

4   said at least one encapsulating packet an indication that said encapsulating packet is a

5   broadcast packet when there is no address of said metropolitan area Ethernet network

6   associated within said memory with a destination address of said inner packet, and said

7   VLAN tag marker marks said encapsulating packet with a VLAN tag corresponding to an

8   entity associated with said port at which said inner packet was received.

1   28.   Program code in computer readable form for use in processing Ethernet

2   packets, said computer readable program code comprising:

3   a module for encapsulating contents of a first packet received at a port of a

4   metropolitan area Ethernet network in at least one encapsulating Ethernet packet that is to

5   traverse said metropolitan area Ethernet network; and

6   a module for assigning the source address of said at least one encapsulating

7   Ethernet packet to be the address of said port at which said packet was received.

1   29.   Apparatus for use in providing metropolitan area Ethernet service,
2   comprising:

3   means for encapsulating contents of a first packet received at a port of a
4   metropolitan area Ethernet network in at least one encapsulating Ethernet packet that is to
5   traverse said metropolitan area Ethernet network; and

6   means for assigning the source address of said at least one encapsulating Ethernet
7   packet to be the address of said port at which said packet was received.

1   30. A metropolitan area Ethernet network, said metropolitan area Ethernet
2   network comprising:

3   a plurality of edge switches, each of said edge switches being coupled to at least
4   one of a plurality of local area networks (LANs) at ports of said edge switches, wherein,
5   said edge switches encapsulate contents of inner packets received from said LANs into at
6   least one encapsulating Ethernet packet, said encapsulating Ethernet packet employing as
7   a source address an address of a one of said ports of said edge switch at which its
8   encapsulated inner packet was received; and

9   at least one core switch for switching said encapsulating packets;

10   wherein each of said plurality of edge switches is coupled to said at least one of
11   said core switches.

1   31. A method for use in packet communication, comprising the steps of:
2   dividing a first Ethernet packet having a source address and a destination address
3   that is received at a port of a metropolitan area Ethernet network into first and second
4   parts, said first and second parts being taken from portions of said first Ethernet packet
5   exclusive of said source address and said destination address;

6   encapsulating said first and second parts in at least two respective encapsulating
7   Ethernet packets that are to traverse said metropolitan area Ethernet network;

8   assigning the source address of each of said encapsulating Ethernet packets to be
9   the address of said port at which said first packet was received;

10   assigning the source address of said first Ethernet packet as an inner source
11   address of each of said encapsulating packets; and

12   assigning the destination address of said first Ethernet packet as an inner
13   destination address of each of said encapsulating packets.

1   32. The invention as defined in claim 31 wherein first and second parts taken

2   from portions of said first packet are divided at a point that is a function of a random

3   number generator with a prescribed distribution.

1   33. A method for use in packet communication, comprising the steps of:

2   receiving at least first and second encapsulating packets at an edge switch of a

3   metropolitan area Ethernet network, each of said encapsulating packets containing a

4   portion of data and/or cyclic redundancy check of a first inner packet that was fragmented

5   into at least first and second encapsulating packets for transport via said metropolitan area

6   Ethernet network; and

7   reassembling said first inner packet using said portions of data and/or cyclic

8   redundancy check contained within said first and second encapsulating packets.

1   34. The invention as defined in claim 33 wherein said first inner packet contained

2   a source address and a destination address and each of said encapsulating packet further

3   contains said source address and said destination address of said first inner packet.

1   35. A method for use in packet communication comprising the steps of:

2   encapsulating a first portion of an inner Ethernet packet received at a port of a

3   metropolitan area Ethernet network into a first encapsulating Ethernet packet;

4   encapsulating a second portion of said inner Ethernet packet into a second

5   encapsulating Ethernet packet when said first encapsulating Ethernet packet would

6   exceed a prescribed Ethernet maximum packet length if said first portion was the entirety

7   of said inner Ethernet packet; and

8   assigning the source address of said first encapsulating Ethernet packet to be the

9   address of said port at which said packet was received.

1   36. The invention as defined in claim 35 further comprising the step of assigning

2   the source address of said second encapsulating Ethernet packet to be the address of said

3   port at which said packet was received when said first encapsulating Ethernet packet

4   would exceed said prescribed Ethernet maximum packet length if said first portion was

5   the entirety of said inner Ethernet packet.

1   37. The invention as defined in claim 36 further comprising the steps of:

2   assigning a first sequence number to said first encapsulating Ethernet packet; and

3   assigning a second sequence number different from said first sequence number to

4 said first encapsulating Ethernet packet.

1   38. The invention as defined in claim 36 wherein the length of said first portion

2 and the length of said portion is selected is selected so that said first and second

3 encapsulating packets conform to a prescribed distribution for lengths of encapsulating

4 packets.